WHAT IS CLAIMED IS:

1. A light emitting device, comprising:

a lower cladding layer;

an optical cavity formed adjacent the lower cladding layer, the optical cavity comprising a lower active region formed from a first material system and an upper active region formed from a second material system; and

an upper cladding layer formed adjacent the optical cavity.

2. The light emitting device of claim 1 wherein the lower active region comprises a first multi-quantum well active region.

3. The light emitting device of claim 2 wherein the upper active region comprises a second multi-quantum well active region.

4. The light emitting device of claim 3 wherein the second multi-quantum well active region comprises a plurality of periodic structure elements in direction of light propagation in said optical cavity.

5. The light emitting device of claim 4 wherein the first multi-quantum well layer comprises a first plurality of quantum wells, wherein each of the first plurality of quantum well layers is separated by a lower active region barrier layer and wherein the first plurality of quantum well layers are formed from a high reactivity material.

6. The light emitting device of claim 5 wherein the high reactivity material comprises aluminum.

7. The light emitting device of claim 5 wherein the high reactivity material comprises antimony.

8. The light emitting device of claim 5 wherein the second multi-quantum well layer comprises a second plurality of quantum wells, wherein each of the second plurality of quantum well layers is separated by an upper active region barrier layer and wherein the second plurality of quantum well layers are formed from a low reactivity material which is not subject to oxidation when etched.

9. The light emitting device of claim 4 further comprising a buffer layer formed between the lower active region and the upper active region, wherein the buffer layer serves as an etch stop layer when forming said plurality of periodic structure elements in said second multi-quantum well active region.

10. The light emitting device of claim 9 wherein the upper and lower cladding layers are doped with opposite dopant types and wherein the buffer layer is doped with same dopant type as the upper cladding layer.

11. The light emitting device of claim 9 further comprising a filler layer formed adjacent to and between the plurality of periodic structure elements of the second multi-quantum well active region.

12. The light emitting device of claim 4 wherein conduction band offsets in the first multi-quantum well active region is larger than conduction band offsets for said second multi-quantum well active region.

13. The light emitting device of claim 12 wherein the optical gain and differential gain of the first multi-quantum well active region is higher than the gain and differential gain of the second multi-quantum well active region.

14. A light emitting device, comprising:

a lower cladding layer;

an optical cavity formed adjacent the lower cladding layer, the optical cavity comprising a lower active region comprising one or more lower active region quantum wells formed from a high reactivity material system and an upper active region comprising one or more upper active region quantum wells formed from a low reactivity material system; and

an upper cladding layer formed adjacent the optical cavity.

15. The light emitting device of claim 14 wherein the upper active region comprises a plurality of periodic structure elements in direction of light propagation in said optical cavity.

16. The light emitting device of claim 15 wherein the high reactivity material comprises aluminum.

17. The light emitting device of claim 15 wherein the high reactivity material comprises antimony.

18. The light emitting device of claim 15 further comprising a buffer layer formed between the lower active region and the upper active region, wherein the buffer layer serves as an etch stop layer when forming said plurality of

periodic structure elements in the upper active region.

19. The light emitting device of claim 18 wherein the upper and lower cladding layers are doped with opposite dopant types and wherein the buffer layer is doped with same dopant type as the upper cladding layer.

20. The light emitting device of claim 18 further comprising a filler layer formed adjacent to and between the plurality of periodic structure elements of the upper active region.

21. The light emitting device of claim 14 wherein conduction band offsets in the lower active region is larger than conduction band offsets in the upper active region.

22. A method for eliminating mode degeneracy and providing single longitudinal mode oscillation in a DFB laser comprising:

forming a first active region from a first material system adjacent a first cladding layer;

forming a second active region from a second material system adjacent the first active region, wherein said second active region comprises a plurality of periodic structure elements in direction of light propagation in said DFB laser; and

forming a second cladding layer adjacent the second active region.

23. The method of claim 22 wherein forming a first active region from a first material system adjacent a first cladding layer comprises forming a first active region from a

high reactivity material system adjacent a first cladding layer.

24. The method of claim 23 wherein the high reactivity material comprises aluminum.

25. The method of claim 23 wherein the high reactivity material comprises antimony.

26. The method of claim 22 further comprising forming a buffer layer adjacent the first active region, wherein the buffer layer serves as an etch stop layer when forming said plurality of periodic structure elements in the second active region.

27. The method of claim 22 further comprising depositing a filler layer adjacent to and between the plurality of periodic structure elements of the second active region.